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XVI.—*Mission to Central Africa.*

- (1. Including a Letter from EDWARD VOGEL, Phil. Dr., to Mr. A. PETERMANN ;
2. Notes compiled from Letters received from the Sappers and Miners attached to the Mission ; and
3. Geographical Positions, communicated by the FOREIGN-OFFICE.)

Read January 9 and 23, 1854.

THE enclosed papers contain the map and section of my route* from Tripoli to Murzuk, based on ten points of latitude and longitude, observed and reduced by myself, as well as thirty carefully ascertained points of altitude, determined barometrically, and compared with simultaneous observations made at Tripoli. My original observations — astronomical, meteorological, and magnetical—are all on their way to the Foreign-Office, together with a small collection of geological specimens and plants. The former I have requested to be sent to Sir Roderick Murchison, whom I would request chemically to analyse the sample of salt and water of the Trona Lake (Bahr el Dúd) which I have sent at the same time. In another enclosure are some remarks on the climate of Fezzan, and of North Africa generally, which you will forward to Colonel Sabine.

Immediately on leaving the gardens of Tripoli the desert commences. The upper portion of the Taghona mountains is without vegetation and water, and strewn with many large stones ; but its southern slope, near the Mulcher pass, has running water, and is here and there overgrown with grass. This region contains numerous Roman ruins. The highest of the Taghona mountains seen by me is 1529 feet above the level of the sea. The valley of Beniolid† extends from W. to E. for about 12 geographical miles, making a small bend about 4 miles from its eastern end. Both slopes of this valley are covered with villages ; and basalt occurs on the southern slope. The bottom of the valley, which is 300 feet lower than Beniolid, is covered with forests of palm and olive trees, and contains twenty-seven wells. The inhabitants are Arabs of the Urfullu tribe, numbering 5000 souls ; and are particularly rich in camels, of which they possess 12,000 head. The point I determined is the village of Dahúr Sibád, situated on the southern slope and at the eastern end of the valley, about 4 miles E. of the castle of Beniolid. From Beniolid we descended a valley, the direction of which is from N. to S., and reached on the second day, 30 miles distant from Beniolid, Wadi Sofejin, at a point where a flat-

* The same as that taken by Lyons and Ritchie, and also by Denham, Clapperton, and Oudney ; and to the east of that selected by Richardson, Overweg, and Barth.

† Visited in 1817 by Admiral Smyth, who pointed out the routes since followed. See Appendix to Smyth's Mediterranean.—ED.

topped mound (Jella Si Amselám), 400 feet high, nearly closes up the latter. This valley extends from S.W. to N.E., in a width of 8 miles, limited to the N. by low sand hills, and to the S. by a range of limestone hills, which separate it from Wadi Zemzem, and contains the well of Enfád. Wadi Sofejin commences at Zentan, near the road from Tripoli to Ghadamis, and terminates in the Gulf of Sidra, between Mesurata and Isa. It forms the most fertile tract of the regency of Tripoli; its upper portion being particularly rich in figs, its middle portion in barley and wheat, and its lower portion near the sea in forests of date trees. According to these features the Arabs call these different parts *Tin* (fig), *Bazín* (cake or pudding), and *Washín* (paste made of dates). In the rainy season Wadi Sofejin is almost entirely inundated. The well of Enfád is surrounded with Roman ruins: the range of hills in which it lies being about 2 miles broad. Beyond this range is Wadi Zemzem, which runs parallel with Wadi Sofejin, and is about 35 miles wide. An inconsiderable elevated tract, about 50 feet high, divides it from Wadi Bejj, which extends likewise from S.W. to N.E. Five miles E. and W. from the point where the road crosses this slight elevation between Wadi Zemzem and Wadi Bejj are wells of bitter water, which are also called Zemzem. Except these and at Enfád there are no wells or inhabited places between Beniolid and Bonjem.

Bonjem is a small place, with 120 inhabitants, a few small gardens, and a castle; the whole being partly filled up with sand. It belongs to the regency of Fezzan, and is only 204 feet above the sea. Since 1843 the inhabitants have been free from taxes; Muhammed Pasha wishing to increase the strength of the place, chiefly as a military station against the bands of robbers in the neighbourhood, who had their stronghold and chief retreat in an ancient castle situated a little E. of Bonjem. The water of the numerous wells is strongly purgative. This place is also remarkable as forming the southern limit in these parts of that curious little animal the flea, which is here replaced by immense numbers of flies. During the march the latter congregated on and about the camels, and during the night they filled our tents. Most of them died before we reached Sokna, which is tolerably well supplied with house-flies; but, strange to say, not a single specimen accompanied us from this place.

Twelve miles S.S.E. from Bonjem is a remarkable hill, the Bazeen, 70 feet high, and consisting of limestone; and about 40 miles further to the S.S.E. is a similar hill, called Khyema, resembling a tent, and 120 feet high. The latter lies at the foot of a range of hills which form a depression or a kind of pass where the road crosses it, called Khórmüt el Mhálleh—*i. e.* "opening for the many," or Wadi Bunáyé. South of the latter a stony desert

again appears, limited in the East by a range of hills running parallel with the road, and about 15 miles distant from it. Twenty miles N. of Sokna a range of hills is crossed, extending in a direction of N.N.W. to S.S.E.; beyond which, in a small lateral valley, is found a well (Tmád el Tár), which is the first water after leaving Bonjem. Every place is called Tmád which yields water after removing the sand.

Sokna is situated in a hollow, 1036 feet above the level of the sea, and entirely surrounded by hills. To the E. there are the Black Mountains (Sode), forming a perfectly level tableland, and assuming, from the blue colour of its rocks, strikingly the appearance of a sea-horizon. The town is well built, and its inhabitants, numbering about 2500 souls, are in prosperous circumstances. The gardens are abundantly supplied with dates and various kinds of fruit. The supply of water is mostly derived from forty wells: they are all hot wells, and their temperature I found to be $88\frac{1}{2}^{\circ}$. Near Sokna are three considerable places—El Xer, 7 miles E.; Wadan, 20 miles E.; and Hoon, 4 miles N.E. The second is situated in the mountains.

Ascending a small valley of the Black Mountain, Godfu is next reached, with a well containing very good water, 1640 feet above the level of the sea. Fifteen miles S. of this well is the highest point of the pass, 2065 feet above the sea; the surrounding mountains being 2160 feet. The Black Mountains consist of yellow sandstone impregnated with iron, from which its crust receives a black colour, appearing in the sun's rays of a deep blue. Large round patches of a yellow or brown colour are often seen on these black rocks, which give to the whole a most remarkable appearance. The summits are low and flat, and the valleys mostly circular or oval-shaped hollows. Animal and vegetable life is entirely absent in this region, which vividly recalls to your mind a landscape by moonlight. The whole range is 25 miles broad. Beyond it, and as far as Om el Abíd, extends the Desert of Ben Afien (Serir ben Afien), perfectly level, with an average elevation of 1370 feet; without animals, without plants, and without water. We passed this desert at night, the heat, during the day on the surface, being so great as to burn the soles of the camels' feet. Fourteen miles N. of Om el Abíd (mother of slaves) are hills of drifting sand, called Gerenfad; and 7 miles further S. are rocks of sandstone, called Kenir. At Sokna are found the first salt-lagoons; but, beyond the Black Mountains, and as far as Murzuk, the surface is everywhere covered with a crust of salt. There is no inhabited place at Om el Abíd, but numerous wells of fresh water 15 feet below the surface. After Om el Abíd we reached Zirrhén or Zeghen; then Sebha, 1380 feet above the level of the sea, formerly a considerable place, and the residence of Abd el

Gelil, now in ruins, and with scarcely 400 inhabitants—the remains of 4000. Between Sebha and Rhodaa is a desert of fine sand, having midway a 60 feet deep well, without water, called Sidir Muserúd Samín. Twelve miles S. of Sebha four mountains are seen on the western horizon, which close up the Wadi Shergi; three of them being flat-topped, and one of a conic form resembling a pyramid.

Murzuk is situated in $25^{\circ} 55' 16''$ N. latitude, and $14^{\circ} 10' 15''$ E. longitude, 1495 feet above the level of the sea, in a sandy desert, interspersed with groups of date-palms. It is a very well built town, with broad streets, which is something very wonderful in an Arab town. The number of inhabitants, including slaves, amounts to 2800. The commerce is considerable, merchandise to the value of about 21,000*l.* changing hands every year, the slave-trade forming seven-eighths of the whole.

In the first week of September I made an excursion to the Trona Lakes of Fezzan, and determined their position. I have also visited those lakes of which Oudney and Clapperton say that they were shut up by inaccessible sand-hills; and, certainly, the desert in which they are situated is of the most terrific character—a labyrinth of hills, undulations, valleys, precipices—presenting literally not one square yard of level ground—formed entirely of drifting sand, in which the camels sank up to their bellies. For carrying my tent and cooking apparatus, together with two water-pipes, in all about 350 lbs. weight, I required no less than five camels; and, nevertheless, performed only $9\frac{1}{2}$ miles in 18 hours. To form an idea of the height of these hills of drifting sand, I measured one trigonometrically, and found it to be 530 feet above the level of the adjoining lake. I desired to determine the height of the lakes by barometer, but found the transport of the latter impossible. The whole of these lakes are situated along the northern side of Wadi Shergi and Wadi Garbi. The direction of these valleys corresponds with a line from Bimbeja and Djerma, two places lying in their northern portion. Their width varies between 3 and 4 miles. The southern edge is formed of abrupt rocks of a soft kind of sandstone, in some places of a black or reddish-brown colour. A row of palm-trees, together with numerous wells and villages, forms a fringe along the northern side throughout the whole Wadi; Bimbeja, Kerkiba, and Djerma (17 miles W. of Kerkiba) being the most important of these villages. Djerma, though nearly as large as Sebha, is almost abandoned, and contains only forty inhabitants. To the W. of Sebha, and also near Murzuk, I found ancient towns, apparently built by the Romans; likewise the enclosure of a well near Djerma, undoubtedly of Roman origin, together with extremely interesting tombs, a description of which I have sent to the Chevalier Bunsen.

As the Trona Lakes, especially that of Bahr el Dúd, were re-

ported to be bottomless, and that every living being venturing in perished inevitably, my people were horrified to see me jump in, in order to sound the depth, which I found to be 18 feet on an average, and 24 feet where it was deepest. The dark colour of the water makes the lakes appear deeper than they really are. Along with my collection of natural history I have sent a small bottle containing some of the celebrated Fezzan worms, called "dúd," already described by Dr. Oudney. I have also sent, in a small box, the only beetle, besides black beetles, which I have found in Fezzan; also a beautiful little creature, called "tantan," which here infests the rooms in the same way as the flies in Europe. It runs with incredible rapidity, and is therefore difficult to catch. Of the worms I send you the enclosed drawing: their taste is very salt. They are caught with cotton nets, in which are hauled up at the same time innumerable flies and other insects, with which the lake is filled. The whole is mixed with a red kind of date into a paste, which has a similar smell and taste to salt-herring, and which is used by the inhabitants of Fezzan in the place of meat, along with bazeen.

2. *Extracts from Letters received from the Sappers and Miners employed on the Mission to Central Africa.*

A. *Tripoli to Murzuk.*—B. *Murzuk to Tibbú.*

A.—Corporal Church and Private Swenny of the Royal Sappers and Miners were selected to join the expedition under Dr. Vogel from about 100 volunteers.

At Tripoli Corporal Church mastered the use of the sextant, mountain barometer, azimuth compass, &c., so as to make accurate and ready observations.

Unfortunately at the commencement of the overland journey, Swenny was seized with congestive fever, and was sent to England. It was judged indispensable to seek for the services of another sapper, and from 36 volunteers of the company of the corps at Malta, Private Maguire was selected, and was at once dispatched to Tripoli to join the expedition.

The caravan employed 37 camels, carrying upwards of 4 tons of baggage, including presents for the Sultan of Bornu and other chiefs. The organization of a force of this kind, with the packing and distribution of the baggage, was a service of no common difficulty. This duty was confided chiefly to Corporal Church, who, in consequence of the temporary indisposition of Dr. Vogel, set out in charge of the expedition on the 19th of June, in company with Mr. H. Warrington,* and arrived at Beniolid on the 26th. Dr. Vogel rejoined the mission on the 2nd of July, and, after the repose of a day or two, the caravan was again in motion.

The expedition was well received on the route, especially at Sokna. A number of people approached them with greeting, and conducted them to an ample residence already prepared for their accommodation, where a supply of provisions was placed at their disposal, consisting of melons, green figs, dates, two sheep, two large dishes of bazeen, and three other dishes. In the evening a similar present was made to the travellers, and for four days after, these

* This, to the success of the expedition, so useful gentleman has since fallen a victim to the climate.—Ed.

benevolent natives persisted in indulging the mission with extravagant proofs of their cordiality and generosity. Offers were made in return to compensate them for their gifts, but they declined to take any equivalent, except a few English knives and razors, which they accepted with unequivocal tokens of satisfaction. On quitting Sokna, the people and the governor of the place accompanied the adventurers a short distance on the road, and took leave of them with kind wishes for their welfare and safety.

The next day the mission entered the Pass of Jebel Asswad or Black Mountains—a region of dreariness and desolation. The stretch of vision was only here relieved by large masses of basalt which seemed to have been upheaved in every direction by some convulsion of nature, whilst in other places the rock had all the semblance of iron suddenly cooled after leaving the furnace. Much of the road was of the worst character, for it was not only hard and broken, but ridged in lines with sharp knife-like edges, which gashed the animals' feet and lamed them. This sterile district extended for more than 50 miles without even a shrub or an insect to invite observation; and, to add to their trials, the travellers were for $4\frac{1}{2}$ days without water, save that carried on the backs of the camels, which, from being constantly influenced by the action of a scorching atmosphere, was always more than tepid, and had lost much of its relish. The heat of the sun was very excessive in those mountains. The thermometer, when exposed to the full blaze of the sun, rushed up speedily to 150° ! and afterwards when Corporal Church withdrew the instrument from the sand in which he had buried it about 6 inches deep, the indication given was 130° . After passing the Black Mountains, the mission counted in one day nine skeletons of camels which had fallen dead in the desert.

The expedition now traversed a far-spreading plain, and then, being short of water, pushed on night and day for the well, called Om el Abíd, or the Mother of Slaves. Before gaining it they were wearied with 66 hours' exertion in the saddle out of 80, and the camel which Church had ridden from Tripoli, fell dead at Enfád from fatigue and exhaustion. In a few days after, 5th August, 1853, the expedition reached Murzuk.

Maguire joined the expedition at Murzuk on the 31st August, having journeyed from Tripoli to Murzuk with 3 or 4 Arabs in 34 days.

B.—The travellers, with Mr. H. Warrington still in company, left Murzuk on the 16th of October, and had a very toilsome journey as far as Gatrone, where they arrived on the 24th of the same month. Seven days they stayed at this place to await the arrival of the remainder of the caravan. In that time they were joined by fourteen Arabs and a caravan of merchants from Egypt, going to Bornu to purchase slaves, which is the principal traffic between Murzuk and the interior. While they were at Gatrone a caravan of about 700 slaves passed through it. Nearly the whole of the miserable creatures were women and children; the grown-up men in the drove did not seem to exceed twenty in number.

The expedition reached Tegery on the 3rd of November, and, after resting for a few days, collecting dates for the use of the camels, moved on the 7th into the Great Desert. In the first three days no less than 250 skeletons of slaves were passed. Fragments of bones and detached limbs were scattered about in vast numbers on the plain; so much so indeed that one could traverse the Desert without much chance of missing the track. At a well (probably Meshrú), about two days' journey from Tegery, the ground presented the appearance of an excavated cemetery, or a place where had been fought a well-contested battle. The tents could not be pitched for masses of bones on the line of march; and, to be free from the obstruction of these sickening relics of mortality, the party was compelled to remove to a distance to encamp for the night.

For 16 days they journeyed onwards without seeing a single native; and for

10 days after leaving Tegery they looked in vain to discover a shrub, a blade of grass, or the slightest trace of vegetable existence. In a valley called Ikba they found a little coarse grass that afforded an acceptable change to the camels after feeding for ten days upon dates.

The travelling was carried on at the rate of 12 and 13 hours a-day without halting. This was equal to a journey of from 25 to 30 miles, and was reckoned to be very fair progress, as camels usually only go over $2\frac{1}{2}$ miles of ground in an hour. The average heat of the sun ranged from 125° to 130° . The two sappers, by turns, watched through the hours of darkness to protect the caravan from injury or surprise, and suffered much from severe cold, owing to the state of the atmosphere falling from its extreme day-heat to a temperature sometimes as low as 45° !

At the date of Corporal Church's last letter (Nov. 28, 1853) the expedition was at Ashanumra, in the country of the tribes of Tibbú, where they arrived on the 27th of November. It was expected that the travellers, with Mr. Warrington, would be in motion again on the 30th of November; and, in 27 days after, would reach Kuka—the rendezvous of the mission—on the shores of Lake Chad.

3. *Geographical Positions of Places in North Africa and Fezzan, determined by Edward Vogel, Phil. Dr.*

Communicated by the FOREIGN-OFFICE.

Name of the Place.	North Latitude.	Long. E. from Greenwich.	Magnet. Declination W.	Magnet. Dip.	Remarks.
	° ' "	n. m. s.	° ' "	° ' "	
* Tripoli . .	32 53 58	0 52 46	14 20 1	49 20 45	Garden 0·15 naut. mile N., and 1·30 E. from the Castle.
† Beniolid . .	31 44 22	0 57 9	12 52 38	.. ..	South edge of the valley, Village of Dahúr Sibad.
Enfád . . .	31 27 39	0 59 48	.. ..	.. ..	300 yards W. from the Well.
Bonjem . . .	30 34 58	1 2 7	12 38 56	.. ..	Castle.
Sokna . . .	29 4 4	1 5 14	12 41 39	43 22 9	Garden of the Mourdir, close to the eastern gate of the Town.
Om el Abíd .	27 30 48	1 1 25	13 3 8	.. ..	Wells.
Gurméda . .	27 14 19	1 0 8	.. ..	.. ..	Wells and Palm-trees.
Sebha . . .	27 2 34	0 58 52	13 22 59	.. ..	Town.
Rhodoa . . .	26 26 1	0 58 35	.. ..	.. ..	Village with Wells.
Murzuk . . .	25 55 16	0 56 41	13 5 43	38 38 12	English Consulate
Bimbeja . .	26 34 48	0 54 41	.. ..	.. ..	Large village in Wadi Shergi.
(Worm Lake) Bahr el Dúd	26 42 0	0 54 57			
Mandra Lake .	26 41 22	0 53 31			
Jerma . . .	26 25 0	0 52 35	.. ..	.. ..	Ancient Capital of Fezzan, Wadi Cherbi (Garbí?).
Godfú . . .	28 50 43	1 4 32	.. ..	.. ..	Well at the foot of the Black Mountains.

* Tripoli Castle is lat. $32^{\circ} 53' 56''$ N.; long. $13^{\circ} 12' 58''$ E. See Smyth's 'Mediterranean.'—ED.

† Beniolid Castle is lat. $31^{\circ} 45' 38''$ N.; long. $14^{\circ} 12' 10''$ E.

Elevation of Places in North Africa and Fezzan above the level of the Mediterranean,
determined with the Barometer.

Name.	Elevation, English Feet.	Remarks.	Name.	Elevation, English Feet.	Remarks.
<i>Tripoli</i> . . .	50½	English garden.	Wadi Zemzem	384	
<i>Ainzara</i> . . .	74	Water-pool in the Desert, 7 miles S. from Tripoli.	Bonjem . . .	204	
<i>Tobras</i> . . .	173	Well, 14 miles S. of Tripoli.	Wadi Bunáyé .	695	48 miles S.E. from Bonjem.
<i>Zeïach</i> . . .	407	Marabut and Well 27 miles S. of Tripoli.	Tmád el Tár .	1110	Well 15 miles N.W.
<i>Mulcher Pass</i> .	704		Mountains . .	1350	.. } from Sokna.
<i>Hills E. of the</i>			<i>Sokna</i> . . .	1036	
<i>Pass</i> . . . }	1309	Taghona Moun- tains.	Godfú . . .	1640	Sode, Black Moun- tains.
<i>Mulcher, Well</i> .	1089		Mountains near }	1900	
<i>Hills E. of the</i>			Godfú . . . }	2065	Sode, 15 miles S. from Godfú.
<i>Well</i> . . . }	1529		Valley in the }	2160	
<i>Máthen</i> . . .	1176	About 25 miles N. from Beniolid.	Black Mount }		
<i>Mi Muher</i> . .	1235	Wadi, 10 miles N. from Beniolid.	Mountains }		
<i>Beniolid</i> . . .	920	South edge of the Wadi.	around it . . }		
<i>Wadi Sofejin</i> .	270	15 miles N.W. of Enfád.	Desert S. of the	1380	About 35 miles S. from Godfú.
<i>Enfád</i> . . .	269	Well.	Sode.		
<i>Ditto</i> . . .	412	Mountains.	Om el Abíd .	1360	
			<i>Sebha</i> . . .	1380	
			Desert between	1590	About 25 miles S. from Sebha.
			Sebha and		
			Rhodoa.		
			Rhodoa . . .	1550	
			<i>Murzuk</i> . . .	1495	Level of the street opposite to the English Consulate.

Murzuk, Oct. 1, 1853.

XVII.—*Extract of a Letter from Dr. Barth to Dr. Beke, dated
Timbuctu, Sept. 7th, 1853.*

With Routes in Central Africa.

Read March 27, 1854.

ON setting out from Libtako we expected to reach Timbuctu in about 20 days, but have been obstructed, partly by heavy rains, swollen streams, the weakness of my camels (of which two have died and four more have been knocked up since leaving Bornu), and by the sickness and trading of the Timbuctu man whom I had hired in Libtako. We were conducted neither by way of Hombori nor by the common pilgrim-road, through Gilgoji, Dalla, and Duenza, but by a roundabout road through some small and independent towns of the Sonray, called Koar by the people of Timbuctu, and then through the midst of the Tuarick tribes of the Tademekket, who occupy all the country S. of the Mayo or Isa for more than 60 miles. We arrived at length, on the 27th of August, at